# THE INDUSTRIAL REVOLUTION COMES TO AMERICA

*The Conestoga Wagon: A Common Vehicle on the National Road*

## Unit Overview

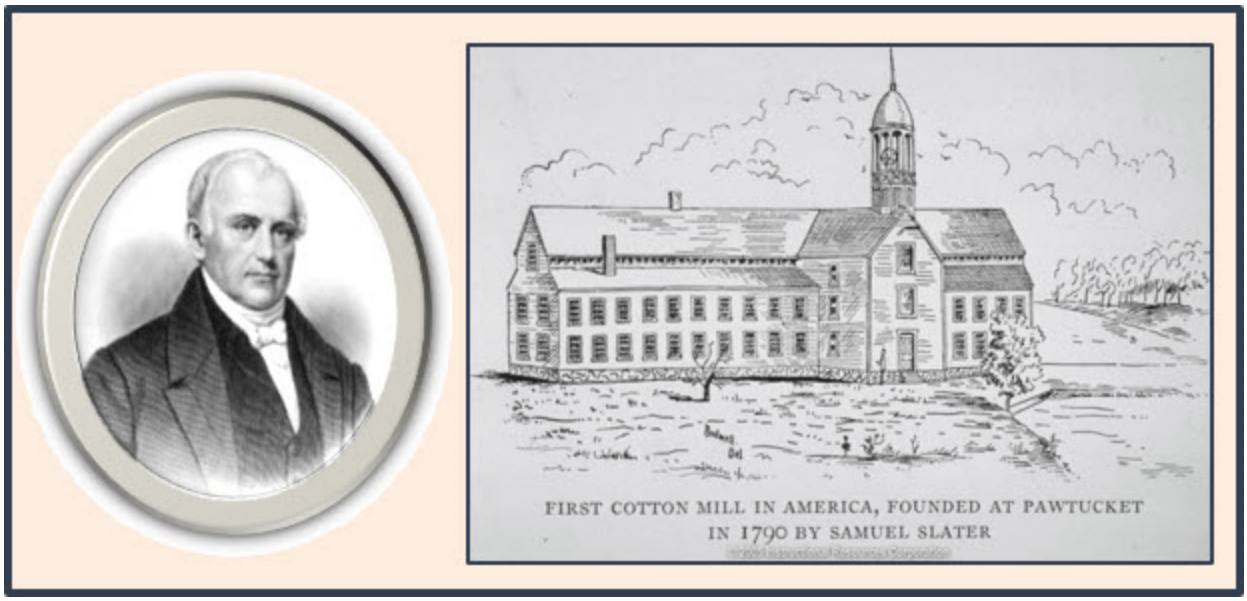
By 1800, the Industrial Revolution had spread from Great Britain to America. Water-powered machinery replaced hand-held tools and transformed the making of cloth from a home-based industry into a factory operation. Technology and the

factory system soon produced a wider variety of goods more efficiently and at a lower cost. Marketing these products in the West encouraged the construction of roads and canals to connect the eastern seaboard with the western frontier. Let's see how it all happened.

## New England and the Industrial Revolution

In the mid-1700s, several British inventors developed machines to do some of the work associated with the making of cloth. Because this equipment ran on waterpower, cloth-making factories, called **textile mills**, were built along rivers and streams. As the number of manufacturing plants increased, more people left their farms to earn steady wages as industrial workers. This series of developments became known as the **Industrial Revolution**.

In an attempt to keep their new, industrial technology a secret, the British government passed laws to prevent their machinery and skilled mechanics from leaving the country. The legislation, however, was impossible to enforce. Enterprising individuals soon found ways to carry the advancements beyond British borders. In 1789, **Samuel Slater** worked in a British factory that spun cotton into thread with the help of machines invented by **Richard Arkwright**. Slater memorized Arkwright's designs and left for America. When he was hired to manage a textile mill in Rhode Island, Slater duplicated Arkwright's equipment and produced cotton thread at a much lower cost. The United States had taken the first step in becoming an industrialized country.




*Samuel Slater and his First American Textile Mill*

Factory owners in Massachusetts, Vermont, New Hampshire and Connecticut soon followed Slater's example. Because New England's poor soil and shorter growing season often made farming difficult, people were willing to leave their fields and find work elsewhere. The region also had rapidly moving streams and rivers necessary to run the new machinery. New England's harbors were another advantage. Cotton arrived on ships from the southern states, while finished cloth left on vessels bound for other areas of the country or Europe.

QuickTime The Industrial Revolution Comes to America

The textile industry continued to streamline manufacturing with the use of technology. In 1814, **Francis Cabot Lowell** opened, the Boston Manufacturing Company, a textile plant, in Waltham, Massachusetts. By using what is now known as the **factory system**, he housed all the processes of spinning thread and making cloth under one roof for the first time. The entire operation of converting raw cotton to cloth was coordinated to increase efficiency and to lower cost.

*Boston Manufacturing Company: National Historic Site*

At the same time, American manufacturers adopted **Eli Whitney's** idea of **interchangeable parts**, which was first used to assemble rifles. With this technique, identical, machine-made parts could be put together by unskilled workers to make a total product. The use of interchangeable parts made it possible to produce a wider variety of goods on a larger scare and to sell them at a cheaper price. This inspired inventors to create more machinery to replace hand-operated tools. To protect an inventor's interests, Congress passed a patent law in 1790. A **patent** gave an inventor the legal rights to the invention and to its profits for a certain period of time.


Go to Questions 1 through 5.

## Workers in Industry

The shift to power-driven machines in factories changed the way people lived and worked in the United States. While these industries employed some workers skilled in a particular craft, most hired unskilled laborers. They worked long hours for low wages. There were no safety standards or laws to prevent unhealthy working conditions. The noise level was earsplitting, and workers found

themselves doing the same tasks over and over. Some textile mills employed entire families; others preferred to hire as many children as possible. They worked the same hours as the adults, but they were paid lower salaries. About one-half of American textile workers were under the age of sixteen in the 1820s. Textile operations owned by the Lowell family were staffed by young, unmarried women, who lived in company-owned dormitories near the plant. The **Lowell Girls**, who composed 80% of the mill's employees, worked to help their families or to save money for their marriages. The letter quoted in the graphic below was written by Mary Paul who worked as a Lowell Girl.

> You wanted to know what I am doing. I am at work in a spinning room and tending four sides of warp which is one girl's work. The overseer tells me that he never had a girl get along better than I do and that he will do the best he can by me. I stand it well, though they tell me that I am growing very poor. I was paid nine shillings a week last payment and am to have more this one though we have been out considerable for backwater which will take off a good deal . The Agent promises to pay us nearly as much as we should have made but I do not think that he will. The payment was up last night and we are to be paid this week. I have a very good boarding place have enough to eat and that which is good enough. The girls are all kind and obliging. The girls that I room with are all from Vermont and good girls too. Now I will tell you about our rules at the boarding house. We have none in particular except that we have to go to bed about 10 o'clock. At half past 4 in the morning the bell rings for us to get up and at five for us to go into the mill. At seven we are called out to breakfast are allowed half an hour between bells and the same at noon till the first of May when we have three quarters of an hour till the first of September. We have dinner at half past 12 and supper at seven.
>
> Mary Paul: April 12, 1846
> Letter to her father

**Immigrants** from foreign lands were also a source of labor for American industrialists. Between 1820 and 1840, almost six million newcomers arrived in the United States. The majority came from **Germany** and **Ireland**. Many German immigrants brought enough money to buy farms or to establish businesses in the cities of the West. The Irish, however, often arrived with little money and settled in the cities of the Northeast. Many had been farmers who rented their land and lost everything when Ireland's potato crop failed for several years. Because the potato was one of Ireland's chief sources of food, over one million men, women

and children died of starvation. In spite of low wages and unsanitary conditions, American factories offered Irish immigrants a chance for survival.

Go to Questions 6 through 10.

## The Demand for Cotton

Although many New Englanders worked in factories, more than 65% of Americans made their living as farmers. Farms in the Northeast were usually small, and most of what they produced was marketed locally. In the South, on the other hand, **cotton** production increased dramatically during the first half of the 1800s. The growth of the textile industry in the United States and Europe steadily increased the demand for this product. Southern plantation owners purchased enslaved Africans to plant, tend and pick the cotton crop. The invention of the **cotton gin** by Eli Whitney made it possible to clean raw cotton faster and in greater quantity. You can see how the device worked by watching the video below.

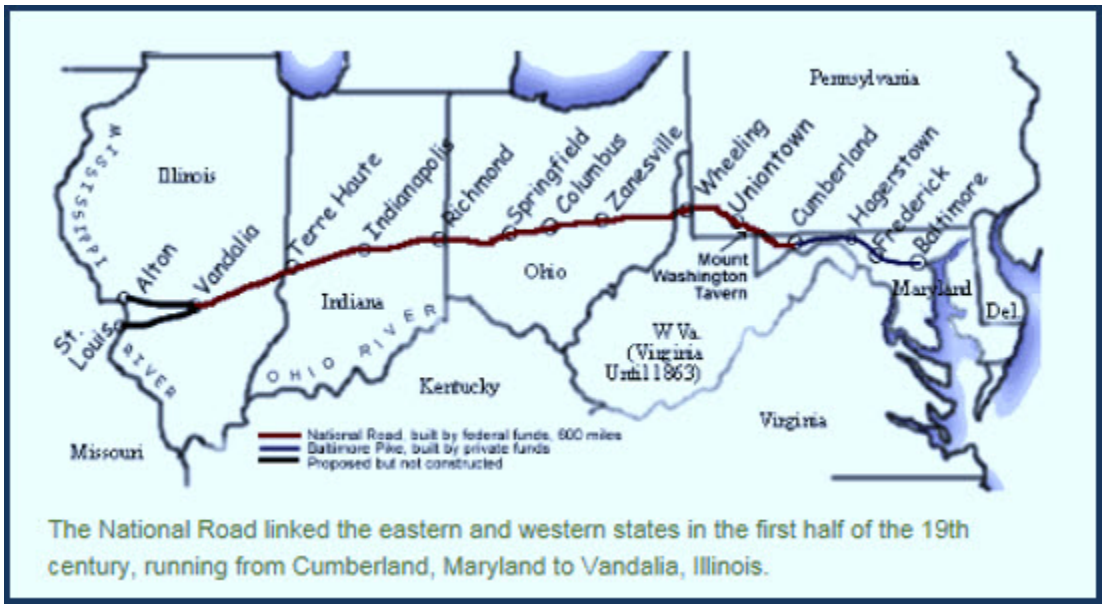
The Cotton Gin

Because the cotton gin made the crop more profitable, plantation owners throughout the South planted more cotton. The amount harvested annually increased from 3,000 bales to 300,000 bales between 1790 and 1820. Southerners continued to export their crop to northern textile mills rather and chose not to construct their own factories. The emphasis on growing cotton, however, drained the soil of its nutrients. This encouraged southern planters to look for additional land in the West and promoted the expansion of slavery.

Go to Questions 11.

## The Need for Better Roads

By 1820, thousands of Americans were moving across the Appalachian Mountains and into the West. Once they established farms, western settlers looked for better routes to transport their crops to eastern markets. At the same time, eastern industrialists wanted to get their manufactured goods to western customers. Unfortunately, it was obvious to everyone that the nation's roads were in poor condition. Rocks, mud, fallen trees and holes made travel difficult and often impossible at certain times of the year. Wet weather turned roads to muddy bogs, and dry weather created clouds of dust. Techniques for building better roads had been developed in Great Britain, and American engineers followed their example. They added drainage ditches to remove excess water and topped roads with tightly packed gravel.




*Map Showing Towns along the National Road: Courtesy of the National Park Service*

Many roads were built with private funds. The owners of these routes charged a **toll** or a fee for the use of the road. Collection gates, also called **pikes**, were placed at intervals along the way. The gates were usually on a hinged pole across the roadway, and guards swung the gates open once the toll was paid. These privately owned roads were called **turnpikes**.

*Red Brick Tavern: Built in 1837 to Serve Travelers on the National Road*

Although turnpike construction boomed during the first two decades of the nineteenth century, there was still no good road to connect the eastern section of the United States with the area west of the Appalachian Mountains. The project was simply too expensive to be undertaken by state governments or private builders. In 1806, Congress approved federal funding for the **National Road** to tie the Midwest to the eastern seaboard. Construction began at Cumberland, Maryland in 1811 but was interrupted by the War of 1812. The National Road stretched to Wheeling, Virginia (now West Virginia) in 1818 and reached Vandalia, Illinois by 1839.


Go to Questions 12 through 14.

## The Canal Age

Although new roads speeded mail delivery, reduced travel time and made stagecoach rides more comfortable, they did not meet all of the nation's transportation needs. Moving big items or large quantities of goods between East

and West was still very expensive and slow. It was cheaper to ship by water, but most major rivers in the United States flowed north to south rather than east to west. It was also very difficult to travel upstream against the current. Things improved when **Robert Fulton** developed a steamboat with a powerful engine. Although the success of the ***Clermont*** and other steamships greatly improved shipping and travel on inland rivers, their routes were dependent on the existing river networks. To solve these problem, Americans built **canals**, man-made waterways that were used to make connections between two bodies of water.

**Section of the Original Erie Canal: Photo Courtesy of D.A. Sonnenfeld**

In New York, Governor **DeWitt Clinton** devised a plan to link New York City with the Great Lakes by building a canal between the towns of **Albany** and **Buffalo**. Thousands of workers, including many Irish immigrants, were employed to construct the 363-mile Erie Canal. The channel opened on October 26, 1825 after two years of continuous digging. For its official opening, Clinton boarded a boat in Buffalo on Lake Erie, journeyed through the Erie Canal and traveled down the **Hudson River** to New York City. To learn more about why and how the canal was built, watch the videos listed below.

QuickTime Why Build the Erie Canal? QuickTime Construction of the Erie Canal

The Erie Canal immediately reduced the cost of shipping one ton of cargo from the Hudson River to Lake Erie from $100 to $15. The success of the Erie Canal resulted in an explosion of canal construction. Within thirty years, the United States had acquired more than 3,600 miles of canals. Along with lowering the cost of transporting goods, the canals increased trade and population in towns and cities along their routes. Cleveland, Detroit, Chicago and Buffalo all benefitted from the surge in canal-building, and New York City became the biggest commercial center on the Atlantic Coast. The map pictured below shows the major canals built between 1790 and 1850.


Go to Questions 15 through 17.

## Growing Towns and Cities

An increase in the number of factories, improvements in transportation and a larger volume of trade drew more people to American cities. New industrial towns also grew rapidly as the demand for workers continued. With the exception of Philadelphia, cities and towns expanded without zoning laws or city codes. It was not unusual to find barnyard animals roaming through unpaved streets. There was

no garbage collection, and most urban areas had no sewers to remove waste water. Diseases, such as typhoid, yellow fever and cholera, sometimes reached epidemic proportions and killed thousands of people. Fire posed a serious threat to congested cities that did not have organized fire departments. Flames easily spread from one cheaply constructed building to another. In 1834, New York experienced a major fire that caused millions of dollars in property damage and bankrupted several insurance companies.

Poor living conditions and low wages sometimes resulted in unrest and destructive riots. The **Flour Riot**, which occurred in New York in 1837, was one example. On a cold, winter day, a crowd that included large numbers of Irish immigrants gathered to protest a recent increase in the price of flour. This impacted almost every household, because it was the main ingredient purchased to make bread. Suspecting that a local businessman was stockpiling flour to drive up the price, the protestors stormed his store and warehouse. Over 400 barrels of flour and thousands of sacks of wheat were destroyed before the New York militia drove the crowd away. Read an excerpt from an eyewitness account quoted in the graphic below.

Barrels of flour, by dozens, fifties and hundreds were tumbled into the street from the doors, and thrown in rapid succession from the windows, and the heads of those which did not break in falling, were instantly staved in. Intermingled with the flour, were sacks of wheat by the hundreds, which were cast into the street, and their contents thrown upon the pavement. About one thousand bushels of wheat, and four or five hundred barrels of flour, were thus wantonly and foolishly as well as wickedly destroyed. The most active of the *destructionists* were foreigners—indeed the greater part of the assemblage was of exotic origin; but there were probably five hundred or a thousand others, standing by and abetting their incendiary labors.

Amidst the falling and bursting of the barrels and sacks of wheat, numbers of women were engaged, like the crones who strip the dead in battle, filling the boxes and baskets with which they were provided, and their aprons, with flour, and making off with it. One of the destructives, a boy named James Roach, was seen upon one of the upper window sills, throwing barrel after barrel into the street, and crying out with every throw—"here goes flour at eight dollars a barrel!" Early in the assault, Mr. Hart's counting room was entered, his books and papers seized and scattered to the winds. And herein, probably, consists his greatest loss.

*New York Commercial Register*: February 14, 1837

In spite of their flaws, there were some advantages to living in the cities and towns. They offered not only jobs in factories but employment in grocery stores, bakeries, hotels and stables. As the cities continued to grow, they added libraries, museums and theaters. For many, the positive aspects of city life outweighed the negative ones.

Go to Questions 18 through 22.

## What Happened Next?

Like his predecessors, James Monroe chose not to run for a third term. After a close election that was decided by the House of Representatives, John Quincy Adams became president in 1825. His chief opponent, Andrew Jackson, won the office in 1828 following a campaign filled with mudslinging and vicious attacks. Jackson and Congress clashed over slavery, economic issues and the power of the executive branch. Before examining Jackson's impact on American politics and presidential power in the next unit, review the names and terms found in Unit 22; then, complete Questions 23 through 32.

Go to Questions 23 through 32.